



## EXTENDERBOX



## USER MANUAL

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## Important Safety Instructions

### General Safety Precautions

- Always keep these instructions to hand. They should remain with the machine in the event it is moved or the regular operator is replaced.
- This machine is designed for professional use in laboratories. It must only be used in accordance with these instructions and its design should not be adapted or modified to fit other applications.
- Any repairs made to this machine must only be carried out by persons authorised by the manufacturer. Any parts or accessories that may be provided by the manufacturer must be used for repair purposes only. Failure to comply with these instructions may damage the machine or cause bodily injury.
- The power supply to the machine is only cut off when it has been unplugged from the mains. Unplug the machine before cleaning it or carrying out any maintenance work. Do not unplug it by pulling on the power cable. If the plug is difficult to access, cut off the power supply from the distribution board or fuse box.
- Make sure the power cable is not trapped under, crushed or otherwise damaged by the rear section of the machine, as this could lead to a risk of electrocution. If you see that the cable has been damaged, get a qualified technician to replace it with a new one immediately.
- The energy requirements for this machine are high. Make sure the existing electricity supply is capable of providing the power required by the machine without risk of power failure. Earthing is obligatory.
- This machine is heavy. Two people are required to lift and move it. Make sure the work surface the machine sits on will be sufficiently robust to support its weight once the water-bath tank is filled.
- Make sure the machine sits perfectly level on the work surface and there is no risk of it falling or being knocked over.
- Ensure the area in which the machine is to be placed is adequately ventilated. The EXTENDERBOX emits a small amount of water vapour as a result of natural evaporation.

- Keep the machine away from external sources of heat or cold.
- The machine's built-in scales are a precision instrument. Take care to prevent objects from falling on it, leaving heavy objects on it for extended periods of time and overloading it in any way.

## **General information**

### **Your choice**

The EXTENDERBOX set automates the reconstitution process for diluents used in the preparation of seminal doses, by directly mixing of powder and water, or by using concentrated pre-dilution.

The pumping system, through peristaltic pumps, allows the fluid to be transferred through high-purity silicone tubing throughout its way, thus avoiding contact with moving mechanical parts and ensuring hygiene.

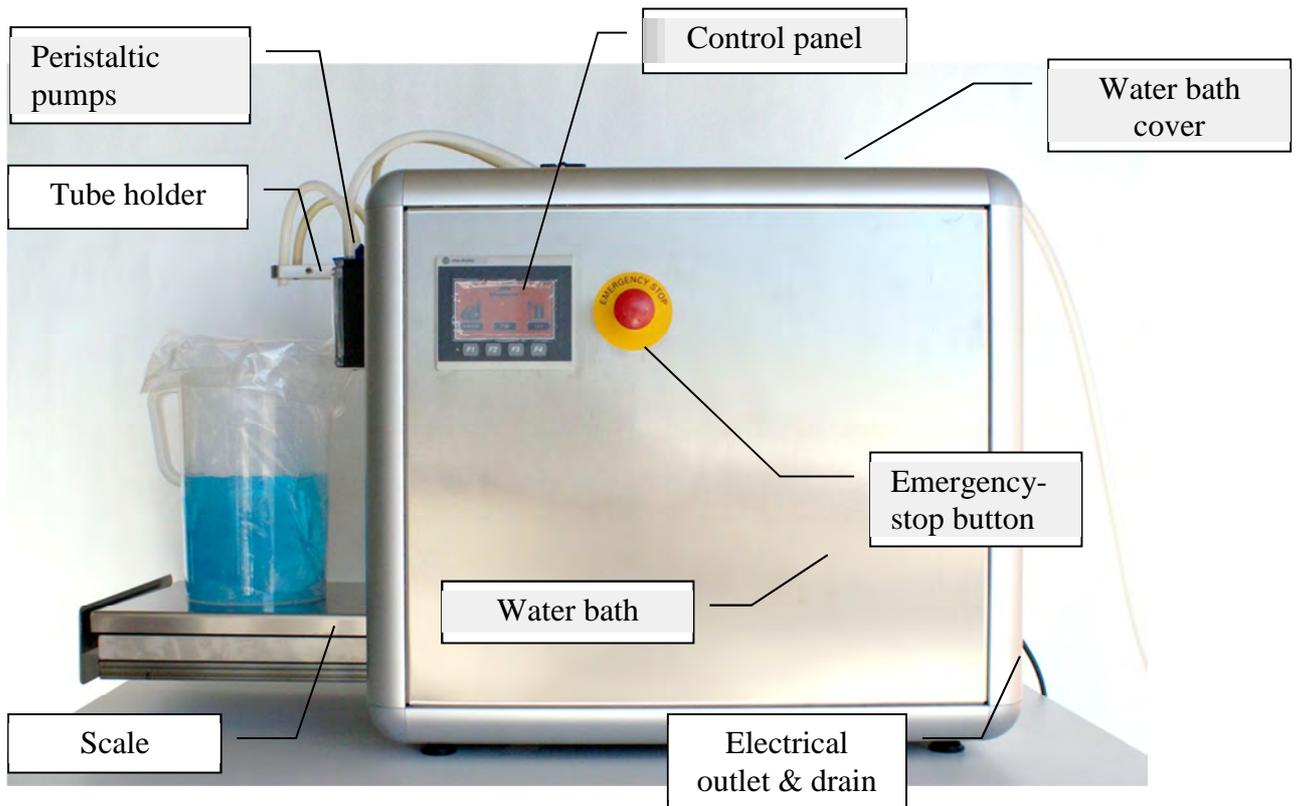
The removable high precision scale adds the advantage of being able to be kept or put away in case of storage, cleaning, or simply as a protection measure.

Its compact design with simple lines and the materials used, stainless steel and anodized aluminum, allow its fitting in any productive installation and cleaning with usual disinfectant products.

Its graphics on the tactile screen for the process control make operation intuitive.

It ensures the complete traceability of the process, being able to connect a bar code reader for the automatic collection of data or the reception of data through the Ethernet bus.

## Description of the Main Parts of the Machine



## Installation and Operation

### Placement

When you unpack EXTENDERBOX, you will find the main unit of the equipment in one piece, next to a box containing the instruction manual, cable and other accessories such as the tube-holding clamp, the end of line weights and the stirring magnet. Apart are included the silicone tubes for both pumps and the standard weight of 10 kg to calibrate the scale.

**Warning:** Heavy equipment. Two people are required to lift it out of the packaging



It is recommended that you locate the machine near the water- and electricity-supply outlets, on a table or strong and leveled bench to support the more than 150 kg that can reach the set once filled the water bath.

Do not place the equipment near aggressive sources of cold or heat, or near equipment that could generate a high vibration level that may affect the weighing accuracy.

### Connection to the Electricity Supply

The machine is fitted with a European "Schuko"-type plug and a general-purpose On/Off switch.

It is important to consider that the power supply line of the equipment must be capable of supplying the 15 amps of maximum current that can be consumed.

It is recommended that the electrical installation allow for automatic disconnection of the supply, such as a magneto-thermal switch of suitable capacity and a residual-current device.

Inside the machine there are a number of fuses, which will be activated in the event of a short-circuit in the machine's internal cabling.

**Important:** Make sure the voltage of the electricity supply matches that indicated on the machine's plate. For the safety of the machine and its operators, it is vital that it be earthed in accordance with the Regulations for Low-Voltage Electrical Equipment. The maximum current required by the machine is approximately 15 A; make sure the electricity supply is able to provide this amount



**The manufacturer shall not be held liable for any claims in the event that these safety measures are not adopted.**

### **Modes of operation**

The basic function of the equipment is to dispense in a jar or container placed on the scale the volume of extender dilution necessary to dilute an ejaculate (for example 2100 milliliters at 36 ° C to produce 25 doses).

Obviously, the equipment is not capable of producing extender dilution by itself but needs to be taken from a previously reconstituted volume, what means a homogeneous mixture of extender powder with the corresponding distilled water volume.

Two ways of reconstituting the extender dilution are possible:

- Using the water bath of 50 L capacity of the equipment, where the volume of distilled water to be consumed during the working day (up to 50 L) will be poured together with the extender powder.
- Using the 10 L auxiliary tank of the equipment, where a volume of concentrated extender dilution, which must have been prepared in advance, will be poured.

In the first mode of operation, which may be the best known practice to the user, the equipment becomes a compact solution to the tank-pump-weighing scale set.

The water bath will warm the distilled water and will carry out the mixing and reconstitution of the powder thanks to the action of a magnetic stirrer placed in the bottom. Once reconstituted, the equipment will use this volume to dose it on request, as the working-day passes.

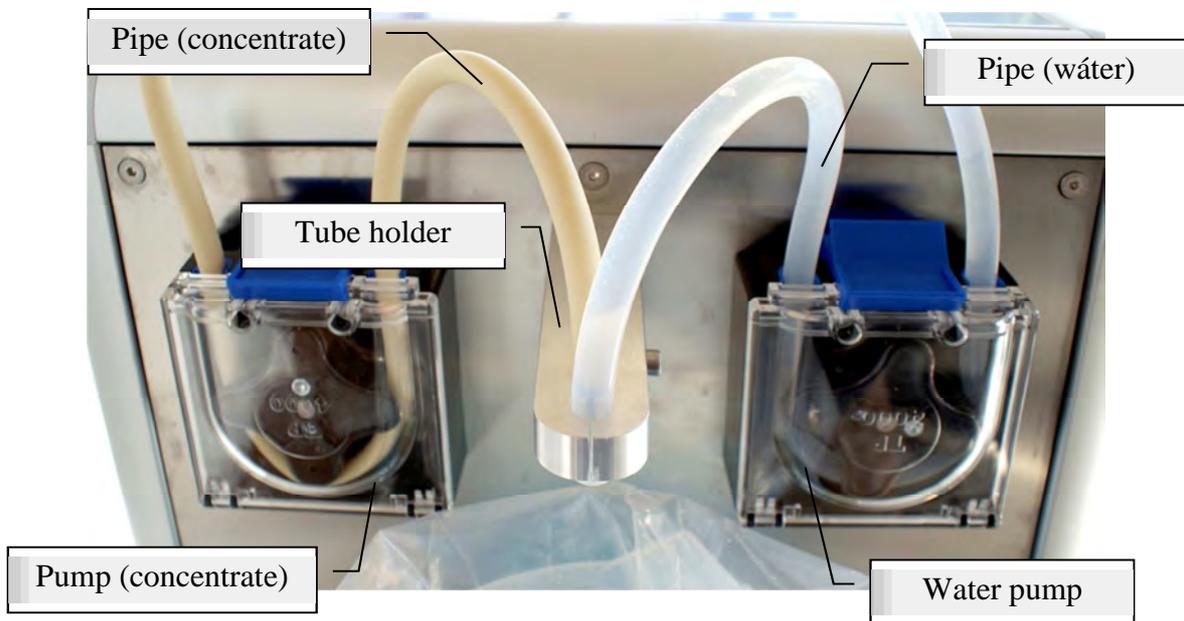
In the second mode of operation, the water bath will perform the heat exchanger function. The distilled water will no longer be poured into the water bath to be mixed with the powder, but the equipment will take cold water from an external tank and will be warmed as it passes through the heat exchanger immersed in the water bath while being pumped towards the container placed on the scale.

Besides, the previously diluted and concentrated extender dilution will be pumped by the second peristaltic pump from the auxiliary tank, where it will be maintained warm, resulting in a mixture of both liquids in the container.

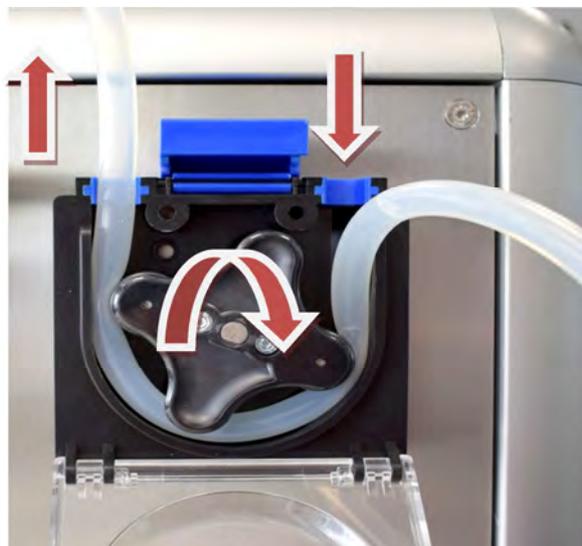
The main advantage of this mode of operation over the first one is that more concentrated extender dilution can be prepared as the equipment consumes it, so that the process will never stop to make a new mixture because the water bath is never empty. In addition, the use of heat exchanger allows a continuous source of hot water, as water is heated as it passes through the exchanger in an uninterrupted way.

**Preparation of equipment for use with reconstituted extender dilution:**

In this case, the suitability of the equipment will consist of placing a silicone tube threaded in the peristaltic pump located on the right side and lead it directly to the water bath.



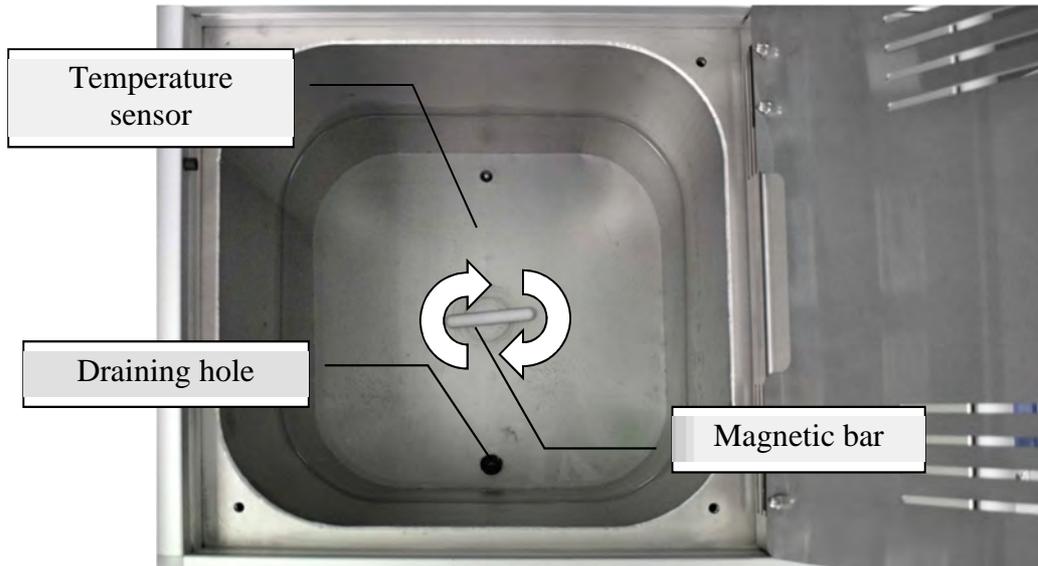
The tube must be made of silicone suitable for food use and have a caliber of 8x 2.4 mm thickness. Observe the direction of rotation of the pumping head and the direction of the suction and discharge flow.



A line end weight will be placed at one end to ensure that the end of the tube is always on the bottom of the bath. The other end will be placed in the tube clamp (holder), an accessory piece that is served in the packaging.

A hygienic bag can be placed in the water bath to avoid having to rinse and dry the inside every time it is used.

In the center of the bottom of the bath, the magnetized bar will be placed that will allow to agitate the water and to carry out the mixture with the powder by turning at 400 rpm.



The next step will be to pour the volume of distilled water expected to be used in the day, up to 50 L of the bath capacity, and proceed with its warming, by means of the activation of the heating resistors and the magnetic bar stirrer. Later, add the extender powder and wait for its complete dilution.

***After a stirring period of approximately 15 min with warm water (36° C), a complete dilution of the extender is achieved.***



Once the dilution is complete, the device's method of use will consist of placing an empty jar or container on the scale and request the desired volume using the tactile terminal, as will be explained later.

From that moment, the peristaltic pump will be operating at maximum speed to pump the volume in the shortest possible time interval. When the volume weighed by the scale approaches the end, the pump will reduce its speed so that the accuracy in the last millilitres is maximum.

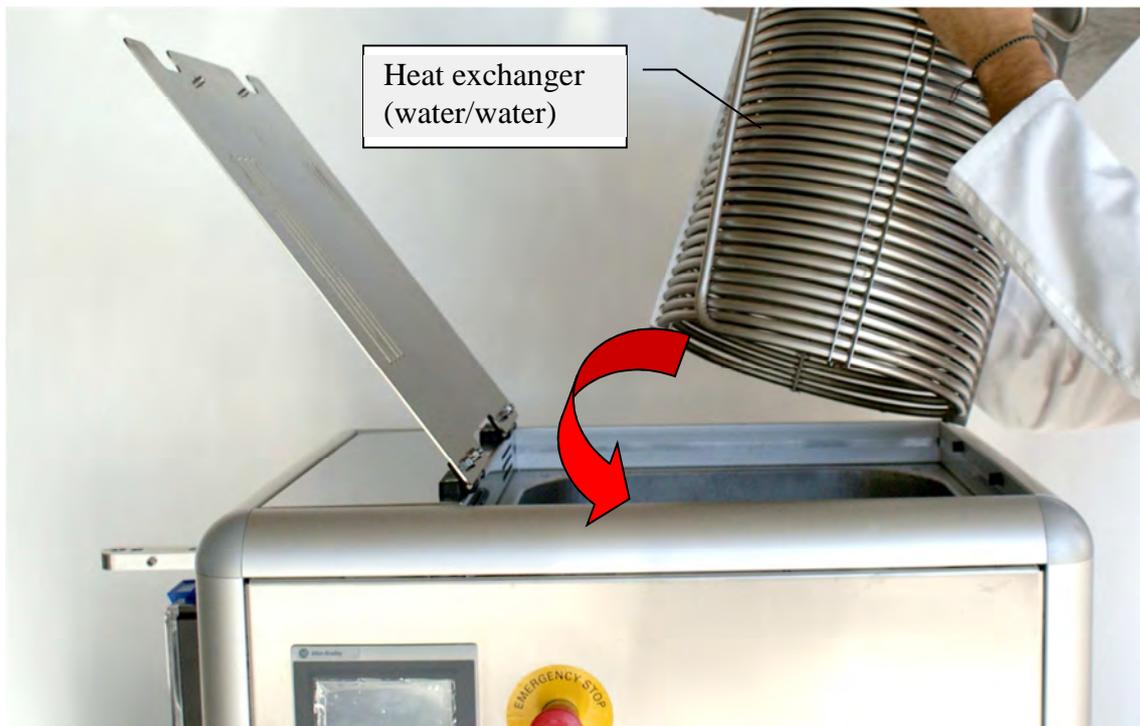
Once the dosing is complete, the equipment will inform the user that he should remove the container, thus leaving the system ready for a new request.

**Preparation of the equipment to use the pre-concentrated dilution.**

In this case, the water bath should be filled with about 30-35 litres of distilled water, and may or may not use the hygienic bag. This will depend on whether the equipment is to be used in this way of working for a few hours or is thus routinely used. In the latter case the bag can be avoided and some chlorinated product added to the water to be kept for a long time without need to renew it.

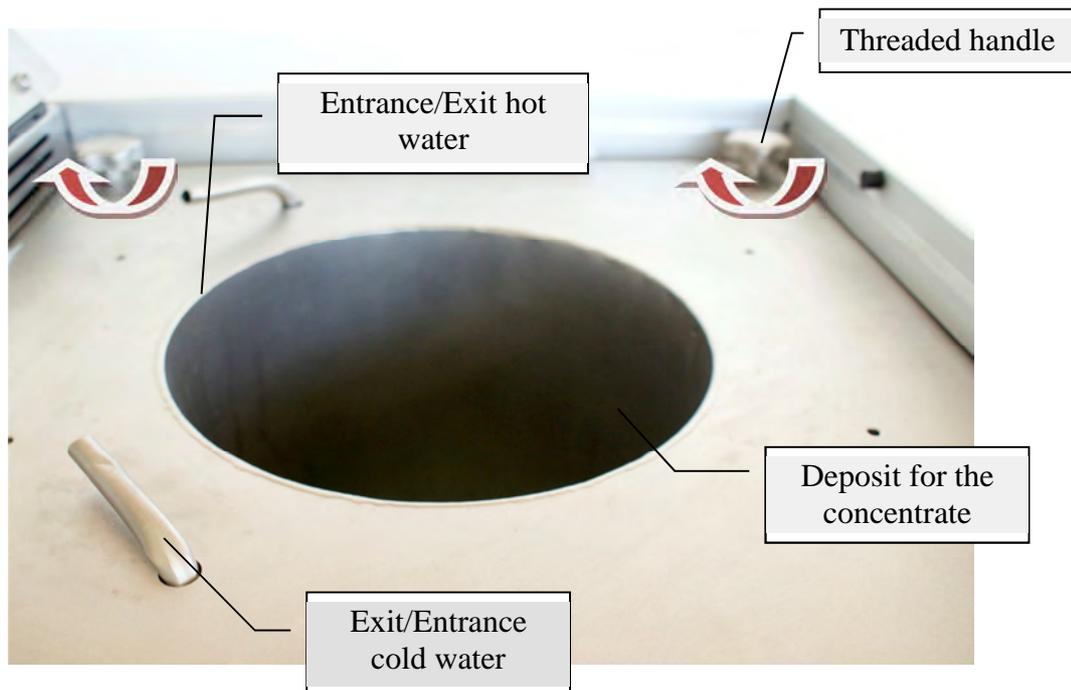
The magnetic bar will be placed in the centre of the tank.

The heat exchanger assembly will be immersed in the bath, fixing it with the 4 stainless steel handles:



As can be seen, the heat exchanger has a water inlet and a water outlet, for the connection of a silicone pipe of 8x2.4 mm.

One should be connected with the silicone hose to the stored distilled water. The other (outlet) will be led to the right peristaltic pump (water pump) where it will be threaded, and the end will be fixed to the clamp.



The exchanger assembly comes with a small auxiliary tank of 10 L capacity that is immersed in the water bath once it has been placed. This reservoir is where the volume of concentrated extender is to be stored temporarily for use, thus preventing it from cooling during the working day and causing alterations in the temperature of the final mixture. It is possible to place a 5L capacity hygienic bag inside, so that it is not necessary to remove the entire assembly for cleaning once the liquid runs low or the working-day is finished.

It will be necessary to lead a 6x2.4 mm caliber hose from the concentrate reservoir to the clamp, threaded into the concentrate pump as shown in the photograph above.

At the opposite end of the tube it is advisable to place the end of line weight so that it is always submerged in the bottom of the tank.

The mode of use of the equipment in this case, will be to request the desired volume using the tactile terminal, having placed before an empty jar or container as in the previous case.

Now the peristaltic pump that transports the extender will be first activated, thus dosing the exact proportion for the mixture. Once the dosing is completed, the peristaltic pump of the distilled water will be started.

When the volume weighed by the scale approaches the end, the pump will reduce its speed so that the accuracy in the last millilitres is maximum.

Once the dosing is complete, the equipment will inform the user that he should remove the container, thus leaving the system ready for a new request.

When dosing is completed, the machine will display a message on the screen indicating that the process is finished.

### Control from the tactile terminal

The equipment has a tactile terminal that allows the control of the operation, the visualization of parameters and alarms, as well as the introduction of orders of operation and selection of other options.

It includes a main menu of habitual use and other 2 menus for adjustment. Next to the terminal, there is an emergency stop button:



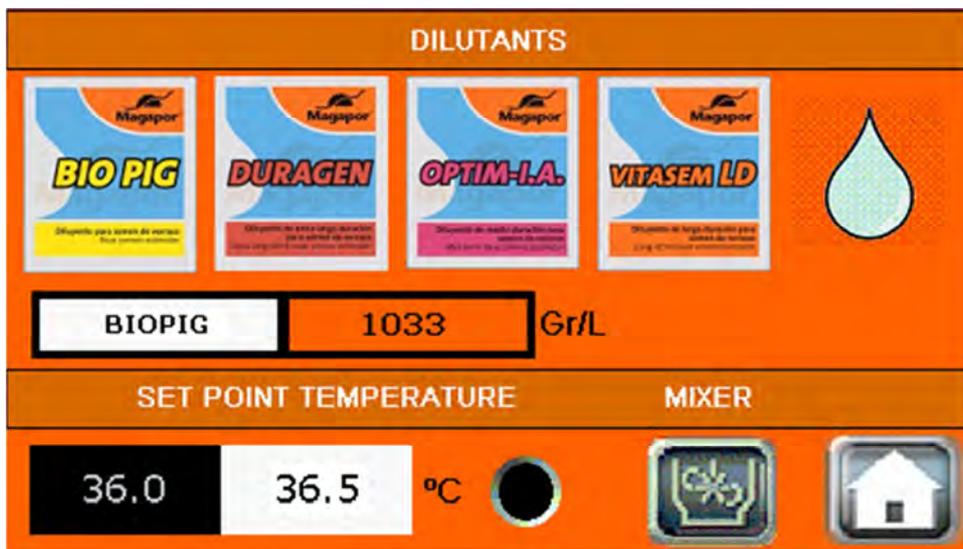
In the main menu, there are 3 different icons:

- Icon "Magapor": Access to the contact for the technical service.
- Icon "Extender": Access to the screen for extender selection and water bath options such as start of heating resistors, adjustment of temperature and start of the magnetic stirrer.
- Icon "Scale": It allows the access to the scale calibration, and also other options such as pumping, return and manual feed of the water pump and the use of one or two pumps.

If the "Magapor" icon is pressed, the user will be directed to a graph where the contact data is displayed, useful in case of doubt or failure:



If the "Extender" icon is pressed, a graphical interface will appear from which you can select the extender to be used and other settings related to the water bath, such as the working temperature, the starter of the heating resistors and the starter of the motor of the magnetic stirrer.



Selecting the extender is very simple, just click on the graphic icon that represents it and automatically the system will take the data of its density. The display shows the extender range of Magapor, and one last symbol representing distilled water.

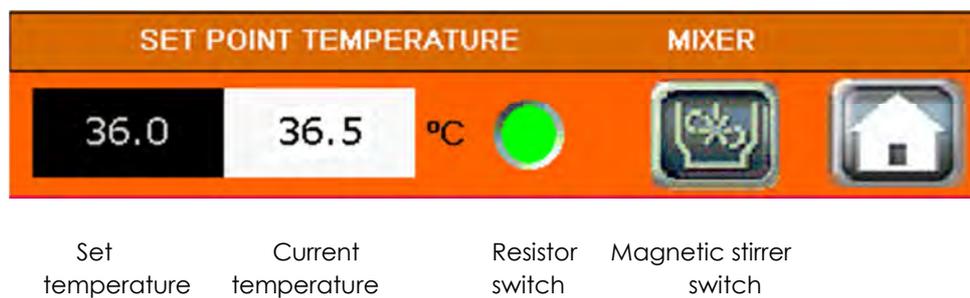
It is necessary to inform the team about the extender to be used since the data of the density will be used to calculate the volume that has been dispensed, in relation directly proportional to the weight.

At the bottom, other options for the water bath are displayed:

- Set temperature of the water bath.
- Current temperature of the water bath.
- Switch on and switch off of the heating resistors.
- Switch on and switch off of the magnetic stirrer.

At the start of the working day, this menu must be accessed in order to adjust the working temperature, the activation of the heating resistors and the magnetic stirrer to carry out the mixing of water and powder or to activate the heat transfer in the exchanger.

When the magnetic stirrer is pressed, the bar will begin to rotate gradually until reaching the speed of the appropriate rotation, about 400 rpm:



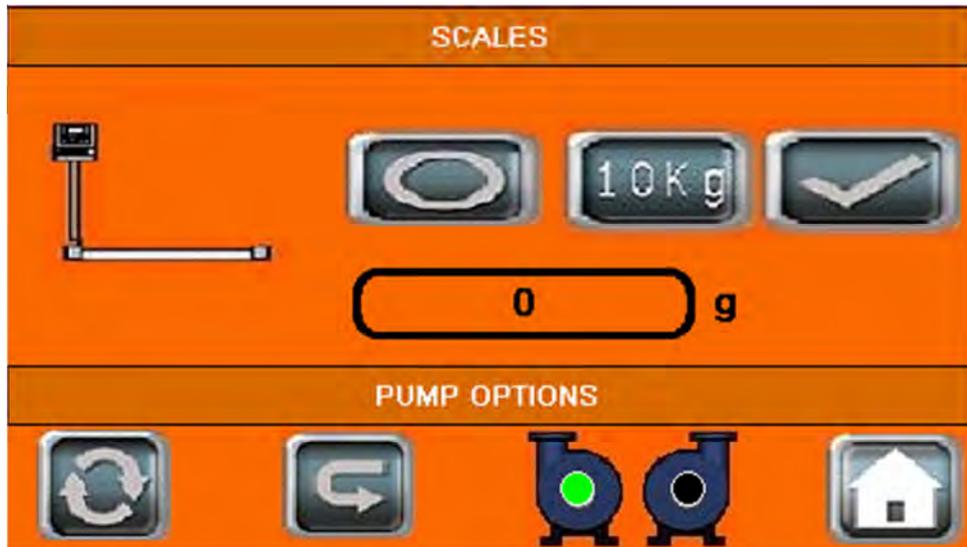
For safety reasons, the resistors and the stirrer will remain switched off every time the equipment is switched off / on, so it will be necessary to activate them each time.

**Caution:** Do not start the heating resistors with an empty water bath. It could result in dangerous overheating that would shorten the life of the bath.



- If the "Scale" icon is pressed, a graphical interface will appear from which you can proceed to the calibration of the scale and the adjustment of the pumping options.

It is recommended to calibrate at the beginning of each working day, once the equipment has remained about 5-10 minutes on. This way, it will be ensured that the weighing that the equipment will carry out during the dosage is always truthful.



The scale calibration procedure is the following:

1. Remove any weight on the scale (containers, drops of water...)
2. Press the button  to interpret the current value as "0" grams.
3. Place on the scale the 10 kg standard weight, included in the packaging.
4. Press the button . The scale will accept the weight of 10,000 grams as valid.
5. Remove the standard weight and press . The calibration will have finished.

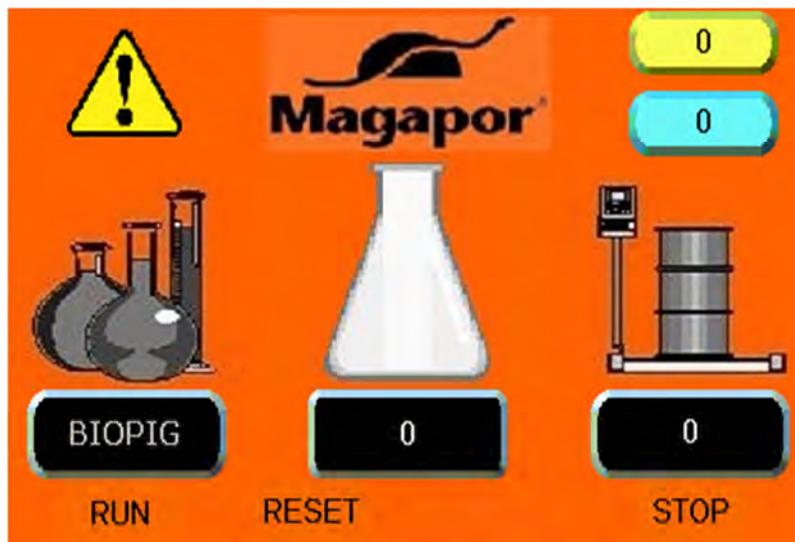
At the bottom of the screen we find the pump options that the user can adjust:

- Manual pumping. While pushing the button  the peristaltic pump of the distilled water will rotate to feed the heat exchanger circuit.
- Reverse pumping. While holding the button  the peristaltic pump of the distilled water will rotate in the reverse direction to allow the heat exchanger circuit to be emptied.
- Selection of the working mode. When the icon  is pressed, the equipment will use the two peristaltic pumps to work. If you only want to use the water bath to carry out the mixing of the powder and you are not going to work with concentrated extender dilution, this option must be deactivated.



Once the extender and the working mode have been selected and the adjustment of the temperature and the calibration of the scale have been carried out, it is possible to start working.

The operations will be carried out from the main menu:



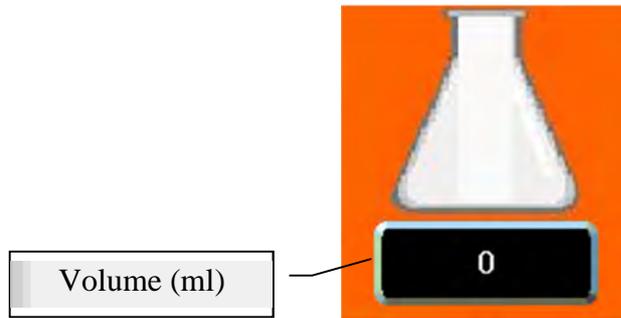
The way of use is summarized in three simple steps:

1. An empty jar or container should be placed on the scale in a centered way and without making contact with the equipment wall, pipes, cables and other object outside the platform that could be the cause of a false weighing. After a moment, the scale will take



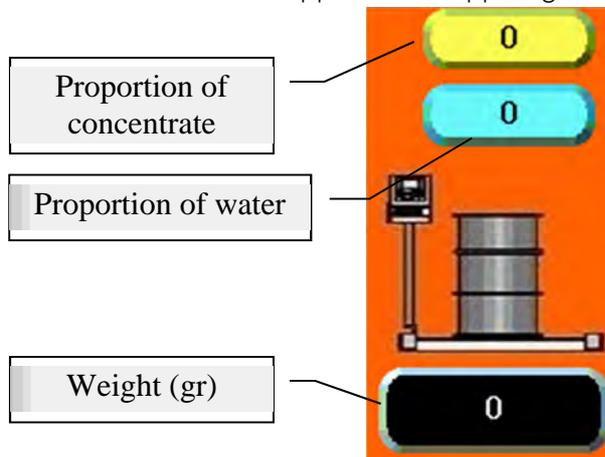
into account its weight and the following icon will be displayed: this means that the weight of the container is stable (set) and the dosing process can start.

2. The value of the required volume must be entered in the numerical field that appears just below the icon. This volume will be expressed in millilitres and will have a lower limit of 150 ml and an upper limit of 12000 ml.



The F1 key (RUN) will be pressed. From this moment, the equipment will measure the volume requested, either directly from the water bath or as a mixture of concentrate and distilled water, according to the work option selected.

If the working mode with concentrated extender has been selected, the proportions of both fluids to be dosed will appear in the upper right corner of the screen:



The weight of the volume being pumped will be displayed in the numerical field relative to the scale.

At any time you can press the F4 (STOP) key to pause the process, and continue later.

If the container is removed from the scale while the equipment is running or paused, the dosing process will automatically be aborted and the terminal will display an error message.

If the equipment detects the lack of fluid when actuating any pump, it will automatically stop the process and will also report it conveniently through another error message.

If the emergency stop button is pressed, the process will stop immediately, showing the corresponding message.

In any of these cases, the device can be reset by pressing the F2 (RESET) key. If the emergency stop button has been pushed, it must also be unlocked.

During dosing, a blue bar on the container icon will be displayed to indicate to the user the relative percentage of the operation:



Once the requested volume has been dosed, a message will be displayed by the terminal, "FINISH", indicating that the process has ended successfully. At this point, the container must be removed and the equipment will be ready for a new process.

Important warnings to consider:

- The weight of the jar or container to be used can not exceed 1000 grs, to allow the correct use of the capacity of the scale. If a larger weight container is placed, the unit will not start when RUN is pressed.
- The weighing limit of the scale is 12 kg, if this limit is exceeded, a warning message will be displayed on the screen. In this sense, the device will also not allow a volume to be dosed greater than 12000 ml..
- The scale can be damaged indefinitely if a weight is placed on top of the platform of more than 15 kg.
- Avoid leaving a weight for a long time on the scale, since accuracy may be affected.
- It is recommended to cover the scale when not in use, so that it is protected from overexertion or accidental falls of objects.

**Attention:** *The scale is designed and tested for the purpose of this equipment. Therefore, the scale has no legal verification and is not suitable for weighing in commercial transactions or for medical or pharmaceutical uses according to Directive 90/384 / EEC on non-automatic weighing equipment.*



### Connection and remote control with the PC

The equipment has the possibility to connect to an Ethernet network and receive data about the volume to be dosed from Gesipor 3.0 software, through this communication protocol.

The connection to a PC makes it possible to send data from the analysis interface itself, so the risk of entering a wrong data in the terminal is reduced, as it is not entered manually.

For more details, contact a commercial agent or an authorized distributor of Magapor S.L.

**Automatic acquisition of data using a bar code reader**

The equipment also has the possibility of connecting a bar code reader for the automatic acquisition of the volume of extender to be dosed, data provided by Gesipor 3.0 software through a printed code on a self-adhesive label.

This is especially useful when working with a high number of ejaculates, so that each can be identified with its corresponding bar code and the possibility of human error when proceeding to its dilution is reduced to the maximum.

Connecting the barcode reader is very easy, just connect the reader's USB terminal to the USB terminal on the back of the control screen, next to the Ethernet terminal. Once connected, the reader will light up and generate an acoustic signal indicating that it is ready to be used.

The data no longer needs to be written manually on the screen, since it is automatically displayed after reading the code.

The code reader device is optional and can be supplied with the machine. For this option, consult the commercial department of Magapor S.L.

## Maintenance and Upkeep

### Cleaning Advice

Use a damp cloth and washing-up liquid to clean the machine. For parts requiring sterilisation, use 70 degree alcohol (70°). Do not use acids, as they may attack the gloss of stainless steel.

It is recommended that you carry out a general cleaning of the unit at least once per month.

The weight, along with the silicone tube used to transfer the concentrate from the container to the exterior of the machine, must be washed thoroughly in distilled water at the end of each day and sterilised in the drying oven.

It is recommended that you sterilize the heat exchanger on a monthly basis. To do so, disconnect the tank from the water supply, remove it from the machine, empty out the water from inside the tube and place it in the oven along with the cover.

You must wash the concentrate container with soap and water on a daily basis, if you are not using hygienic bags.

It is recommended to use the hygienic bag for the water bath especially if the water is to be prepared directly in the water bath.

For the use of concentrate, It is recommended that you use distilled water in the bath to avoid calcareous deposits, and add a chlorinated product in order to prevent the spread of microorganisms.

It is recommended that you monthly lubricate the rollers in the peristaltic pumps with vaseline, in order to prolong the working life of the silicone tubes and facilitate the rotation of the pump engines.

If the machine is not going to be used for a long period of time, disconnect it from the electricity and water supplies, empty the water-bath and store it in a clean and dry location.

**Hazard warning:** Before carrying out any form of authorised maintenance or procedure, make sure the area or parts in question are not connected to the electricity supply. **Unplug the unit at the socket.**



## Technical specifications

Supply voltage and frequency	<b>230V 50-60Hz</b>
Nominal power:	<b>2500 W</b>
Water bath capacity:	50 L
Concentrate-container capacity:	10 L
Working temperature:	Ambient temperature up to 40°C
Heating power:	2300 W
Scale maximum capacity:	12 Kg
Pumped flow:	<b>1.5 L/min</b>
External dimensions (with the scale stored) (LxHxP):	<b>70 x 65 x 55 cm</b>
Empty weight (with exchanger):	<b>100 Kg</b>
Operating conditions :	<b>For use within laboratories</b> <b>Ambient temperature: 5 – 40°C</b> <b>Maximum altitude: 2000 m</b> <b>Relative humidity: 80% at 31°C, up to 50% at 40°C</b> <b>Maximum voltage fluctuations in electricity supply: +/- 10%</b> <b>Category II transient overvoltage</b>

## Troubleshooting

Problem	Potential cause	Solution
The machine does not turn on when connected to the network	<ul style="list-style-type: none"> <li>A. Insufficient voltage or fuse blown</li> <li>B. Defective cable</li> <li>C. Internal fault</li> </ul>	<ul style="list-style-type: none"> <li>A and B. Check voltage and condition of fuse and cable</li> <li>C. Contact the Technical Services Department</li> </ul>
Scales do not weigh, or the amount of product dispensed is incorrect	<ul style="list-style-type: none"> <li>A. Scale not calibrated</li> <li>B. Inadequate tube</li> <li>C. Scales connection cable defective</li> <li>D. Internal fault</li> </ul>	<ul style="list-style-type: none"> <li>A. Calibrate scales</li> <li>B. Use adequate silicone tube</li> <li>C and D. Contact the Technical Services Department</li> </ul>
Peristaltic pumps do not rotate when dispensing operation commences	<ul style="list-style-type: none"> <li>A. No container on scales</li> <li>B. Insufficient water supply, or concentrate run out</li> <li>C. Inadequate tube</li> <li>D. Internal fault</li> </ul>	<ul style="list-style-type: none"> <li>A. Place container on scales</li> <li>B. Check water supply and level of concentrate, and add more if required</li> <li>C. Use adequate silicone tube</li> <li>D. Contact the Technical Services Department</li> </ul>
Water-bath will not heat to the desired temperature	<ul style="list-style-type: none"> <li>A. Low water level</li> <li>B. Temperature incorrectly assigned</li> <li>C. Internal fault</li> </ul>	<ul style="list-style-type: none"> <li>A. Check water level</li> <li>B. Follow procedure in instruction manual</li> <li>C. Contact the Technical Services Department</li> </ul>
The magnetic stirrer does not rotate.	<ul style="list-style-type: none"> <li>A. It was not operated correctly.</li> <li>B. Internal fault.</li> </ul>	<ul style="list-style-type: none"> <li>A. Follow procedure in instruction manual</li> <li>B. Contact the Technical Services Department</li> </ul>





## **Magapor S.L.**

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